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**REMARKS****Amendment of the Specification**

By the foregoing amendment, Applicants have amended Paragraphs [00026] and [00030] of the specification, amended claims 1, 2, 3, 5-8, 11, 16-18, 20 and 23 and added new dependent claims 25 through 29. No new matter (35 USC 132) has been entered.

The amendments to paragraphs [00026] and [00030] of the specification are editorial in nature, correcting inadvertent and self-evident errors, and adding further reference numbers for clarity.

**Amendment of the Claims**

The claims have been amended herein to make various corrections for improved clarity and/or proper antecedence, in respect of the prior amendment of independent claim 1 to require the presence of two sample loops.

Amendments have also been made to remove superfluous text as well as to better specify the subject matter of the claims. In addition, the claims have been restored to original text, in respect of the purging medium, i.e., a gas.

Claim 1 has been amended to recite that each sample loop holds a known amount of the sample and that the purge gas flushes the whole or a portion of the system. No new matter (35 USC 132) is presented as the former is inherent and the latter is fully supported by the whole of the specification, particularly paragraph [00028] and [00031], and the figures.

Claim 5 has been amended to add reference to the system as arranged for flow of sample through the sample loop.

Claim 11 has been amended to clarify that the capacity recited is the capacity of each loop and not the combined capacity of the two loops, consistent with the recitation in such claim as originally filed.

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New claims 25 through 28 recite arrangements in which the system comprises a single multi-port valve and two sample loops (claims 25-28) and arrangements in which the system includes two actuatable multi-port valves, each of which is in fluid communication with one of the two, but not the same, sample loops (claim 29). These claims are fully supported by the disclosure of Figures 1 and 2, respectively, as well as the specification. No new matter (35 USC 132) has been entered.

**Rejection under 35 U.S.C. §112, first paragraph**

In the December 28, 2005 Office Action, claims 1-19 were rejected under 35 U.S.C. §112, first paragraph, for failing to comply with the written description requirement. It was alleged that the claims contained subject matter which was not in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors had possession of the claimed invention at the time the application was filed.

More specifically, it was alleged that a purging fluid source was not described in the specification and that the only mention of a purging source was in Paragraph [00030] specifically stating that the purging source was a gas.

In order to expedite the allowance of the present application, applicants have amended the claims to recite that the purging material is a gas.<sup>1</sup>

In light of the foregoing amendment to identify the purge material as a gas, the rejection under 35 U.S.C. §112, first paragraph is overcome. It therefore is requested that the rejection be withdrawn.

**Rejection under 35 U.S.C. §103(a)**

In the December 28, 2006 Office Action, claims 1-23 were rejected under 35 U.S.C. §103(a) as being unpatentable over Eckles, et al. (U.S. Patent No.: 4,326,940 - hereinafter "Eckles").

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<sup>1</sup> However, applicants reserve the right to file a further continuation application directed to the system in which the purging material is a fluid. Though a gas purge is the preferred embodiment, support is present in the application as filed for a liquid purging material (see paragraph [00031] referring to "a flushing liquid.")

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Eckles was asserted as teaching an on-stream apparatus for analyzing the concentrations of chemical components in an electroplating bath, the apparatus comprising "a column 10, a UV radiation detector 11 and an electrochemical detector, all of which are analysis chambers." (page 3, December 28, 2005 Office Action).

Eckles in such Office Action was further alleged to provide (in the paragraph bridging pages 3 and 4 of the Office Action):

"a microprocessor controller 4 that controls sample flow throughout the system (col. 7, lines 36-66) that include controlling the 4 way valve and the multiport for injection of sample, directing the sample to a waste line, purging the sample lines by a purge gas, and further directing the purge gas to a waste line. A purging gas source 92 of nitrogen is provided in communication with the four-way valve 20 (col. 8, lines 8-12), also inert gas 100 (nitrogen) is connected to the electrochemical detector 12 for purging or reference signal generation (col. 10, lines 8-11)....A source of inert gas 100, such as nitrogen, may be connected to the electrochemical detector 12 for normal purposes, such as purging reference signal generation, etc. (col. 10, lines 8-11)"

Additionally, while it is acknowledged in the Office Action that Eckles does not specifically teach a flow sensor or two sample loops, the Office has contended that Eckles teaches that the samples are volumetrically applied to the HPLC column and, therefore, it would have been obvious to one having ordinary skill in the art to employ a flow sensor in order to provide precise volumes of sample to the analysis chamber.

Further, in respect of the two sample loops, the Office Action contends that it would have been obvious to modify Eckles to employ two sample loops for uptake of samples, so that two samples representing the current electroplating bath solution could be on hand for analysis and that, following *In re Harza*, 124 USPQ 378, the mere duplication of parts has no patentable significance unless a new and unexpected result is produced.

Applicants respectfully traverse the rejection and request reconsideration of the patentability of the amended claims in light of the ensuing remarks.

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***Flow Sensor***

First, concerning the flow sensor, as noted above, it was stated in the Office Action that “[I]t would have been obvious to one having ordinary skill in the art to employ a flow sensor in order to provide precise volumes of sample to analysis chamber to aid in concentration calculations” (emphasis added; page 4 of the December 28, 2005 Office Action). Such an assertion is without merit and completely erroneous.

In accordance with Eckles, as well as Applicants’ invention, the quantity of electroplating bath solution that is to be provided to the analysis chamber(s) for analysis is determined solely by the size of the sample loop (see col. 6, lines 51-56). The flow sensor thus has nothing to do with the volume of the sample aliquot to be sent for analysis.

The flow sensor in Applicants’ invention ensures that the purging gas and/or the prior sample of electroplating bath solution have been fully removed from the sampling duct before isolating the sample loop from the sampling duct and thereby isolating the new sample aliquot for analysis. Eckles has no need for a flow sensor since Eckles does not purge its sampling system. Instead, Eckles allows the sample fluid to pass through the sample injection valve 50 and into the waste container 72 for a predetermined time (based on the known volume of the sample lines and flow rate) before it then isolates the sample loop 51 to take the aliquot of the sample for analysis.

Thus, there is no reason to add a component/device to the system of Eckles where there is no apparent need or benefit to be gained by its adoption. Such would be merely a superfluous, added expense. Again, because a gas is employed to purge the sampling duct of Applicants’ invention, a flow sensor is needed to determine when flow of the electroplating bath solution is resumed and a given quantity passes by to ensure that a good sample is present in the sample loop before its isolation. By contrast, Eckles has no need for a flow sensor since Eckles does not purge its sampling system Thus, Applicants’ flow sensor is critical to the operation of Applicant’s system, but such flow sensor finds no derivative basis in the disclosure of Eckles.

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*Multiple Sample Loops*

Secondly, it is alleged that the presence of two sample loops is mere redundancy or duplication of components whereby two samples of the same solution are on hand for analysis. While such a contention may, in retrospect, seem logical, Eckles makes no mention of the possibility of two loops. Additionally, such dual loops would not seem to be in any way applicable to Eckles for the reasons set forth in the prior response, which are hereby incorporated by reference, as well as for the following additional reasons.

Applicants' use of two sample loops has many benefits and advantages neither apparent nor obvious from Eckles. In one respect, having two sample loops enables one to perform duplicate tests on a given sample for quality control purposes. By ensuring that the test results are repeatable, one is able to avoid anomalous results which may i) incorrectly instruct the electroplating system to make adjustments to the electroplating bath when none is needed or ii) fail to make such instructions when an adjustment is needed. Nowhere does Eckles suggest, infer or motivate one to provide such duplication for quality control purposes or the desirability of having such capability, even if used only periodically.

In another respect, having two sampling loops enables one to perform two different analyses on the same sample without concern that one test methodology or the reagents employed therewith may contaminate, alter or otherwise render the sample inappropriate for a different test. Eckles does conduct a number of analyses on the same sample, but does so in series. Series relationship is important for the Eckles system, indeed, it may be its most critical factor, since the column helps separate components of the electroplating bath solution for enhancing their analysis or detection (see e.g., Col. 8, lines 22-34). At the same time, Eckles also mentions the problems of the materials or conditions of one test affecting a subsequent test on the same sample and, therefore, teaches the importance of the proper sequencing of the tests to be performed (see Col. 3, lines 14-20). In spite of this, nowhere does Eckles suggest or motivate one to use multiple sample loops to capture multiple aliquots of the same sample so as to be able to perform multiple tests on the same virgin sample.

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Finally, and perhaps more significantly, the presence of two or more loops allows one to design a system wherein the volume of one loop is different from that of the other. This can be especially critical where a given test requires a greater volume of the electroplating bath solution than another. Though one could presumably size the one loop to the maximum volume needed to perform all the tests to be conducted, this would then necessitate sampling excess electroplating solution and, perhaps more importantly, excess reagents than would normally be needed to actually perform certain other tests. Since the electroplating bath solution and many of the reagents needed for certain tests are very expensive, this adds costs unnecessarily. Furthermore, in those tests where the total amount, rather than the concentration, of a given constituent is important, having a large loop will enable one to more easily detect that constituent, especially where its concentration is low and/or minimum detection capabilities of the test methods or equipment are high.

For all of these reasons, and those set forth in the prior response, Applicants' use of multiple loops is neither obvious from Eckles nor a mere duplication of components for increasing the throughput of a given device as required for a holding under *In re Harza*. Thus, the rejection over Eckles relative to the presence of multiple sample loops is fully rebutted and should be withdrawn.

### ***Purging***

Finally, perhaps the most critical distinction between the system of Eckles and that of Applicants relates to the ability of Applicants' system to purge the electroplating bath solution from the sampling duct, the sample duct and the sample loop, or the whole of the system apparatus through which the sample flows.

As recited above, the Office Action sets forth several alleged instances where the system of Eckles is purged with a purging gas. In only one of those instances, that pertaining to the employment of a nitrogen gas source 100 for purging the DME/GEC Flow Cell 12, is the statement correct.

Contrary to the allegation made in the Office Action, the nitrogen source 92 is employed as a pneumatic fluid for operating the sampling valve 20. The gas neither enters the ducting for the electroplating bath solution nor, in any other way, leads to the purging of the electroplating bath solution from the sampling pathway. Similarly, although reference to purging is made in relation to the inert gas source 82, the only purging considered is the purging of oxygen and other gases

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from the plurality of solvents before they enter the flow pathway to the sample injection valve 50. The inert gas is employed to pressurize the solvent sources thereby inducing the degassing effect. (see Col. 7, lines 36-66)

Nowhere does Eckles allow for, suggest or motivate one to create a system which employs a gas to purge the conduits through which the electroplating solution flows so as to ensure that one sample or analyzed sample does not contaminate the next. While, as noted above, Eckles does employ a gas purge of the DME/GEC Flow Cell, this is at the very last detector device in the Eckles system: it does not address concerns for cross-contamination or intermixing of samples earlier in the flow path, especially before the first analysis chamber. Furthermore, nothing in Eckles would suggest or motivate one to alter their system to enable one to purge the electrochemical plating solution from the sampling conduits, sample loops, etc., especially with a gas. If anything, one having ordinary skill in the art would be motivated to avoid such a configuration.

Specifically, those skilled in the art, indeed anyone knowledgeable of HPLC chromatography and HPLC columns, is fully cognizant of the importance of keeping the solvent in the column at all times and of ensuring that the solvent as well as solutions to be passed through the column are devoid of gases or bubbles. Otherwise, the results of any testing will be useless and/or the pressures within the system may exceed their cutoff limits resulting in a shut down of the system. Indeed, this very requirement is reflected in Eckles' action whereby the solvents are subjected to pressurized inert gas in order to remove any gases in the solvents before they are employed in the analyzer system. Similarly, the need to maintain the liquid environment in the column is further reinforced by Eckles' teaching that the mobile phase or solvent is continuously flowed to the HPLC column (See Col. 7, lines 4-13).

Eckles' use of a purging gas downstream of the column is not an issue since there is no concern or possibility of the gas getting into the column. On the other hand, Eckles' effort and requirement of degassing fluids upstream of the column would certainly dictate against modifying the Eckles system to add a gas purge upstream of the column. Since the modification of Eckles, as suggested by the Examiner, would render the Eckles et. al. system useless for its intended purpose, the proposed modification is unobvious. (See *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed Cir. 1984))

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Thus, Eckles does not create a presumption of prima facie obviousness and the rejection of claims 1-23 should therefore be withdrawn and the claims passed to allowance.

**Claims Fees Payable**

Five (5) dependent claims have been added increasing the total number of claims from the original twenty four (24) to twenty-nine (29). Therefore, an added claims fee in the amount of \$250 is due at this time.

A credit card authorization form is enclosed authorizing charging of the amount of \$250 to the credit card specified therein.

Authorization is hereby given to charge the amount of any deficiency in fees for this response, to Deposit Account No. 08-3284 of Intellectual Property/Technology Law.

**Rejoinder of Withdrawn Claim 24**

Applicants request that claim 24 be taken up for examination when the product claims are found patentable.

**CONCLUSION**

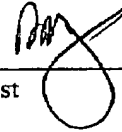
Applicants have amended the claims to remove the basis for the 35 U.S.C. §112, first paragraph, rejection and have fully rebutted the allegations of prima facie obviousness as well as effectively removed Ekles, the sole reference, as a reference. Applicants' invention, as defined by the pending claims, is clearly novel and unobvious.

Therefore, it is requested that Examiner Siefke reconsider the patentability of all pending claims, claims 1-29 in light of the distinguishing remarks herein, and withdraw all rejections, thereby placing the application in condition for allowance. Notice of the same is earnestly solicited. In the event that any issues remain, Examiner Siefke is requested to contact the undersigned attorney at (919) 419-9350 to resolve same.



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Respectfully submitted,



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